Vakioita:

$g = 9.80 m/s^2$, $\epsilon_0 = 8.854 \times 10^{-12} C^2/N \cdot m^2$, ja $e = 1.602 \times 10^{-19} C$. $1eV = 1.602 \times 10^{-19} J$.
$c = 3.0 \times 10^8 m/s$, elektronin massa $m_e = 9.11 \times 10^{-31} kg$,
Matemaattisia kaavoja: $sin^2(\alpha) + cos^2(\alpha) = 1$,
Pallon pinta-ala $A = 4\pi r^2$, pallon tilavuus $4\pi r^3/3$.
Ympyrän kehän pituus $l = 2\pi r$ ja ympyrän pinta-ala $A = \pi r^2$.

Ohessa sekalainen kokoelma kaavoja, joista voi olla hyötyä. Huomaa, että kaikki kaavat eivät ole yleispäteviä vaan soveltuvat vain erikoistapauksiin

$\mathrm{v} = \frac{d\mathrm{r}}{dt}$, $\mathrm{a} = \frac{d\mathrm{v}}{dt}$, $x = x_0 + \int_0^t v dt$, $v = v_0 + \int_0^t a dt$, $x = x_0 + v_0 t + \frac{1}{2} a t^2$, $v = v_0 + at$, $a_{rad} = \frac{v^2}{R}$, $v = \frac{2\pi R}{T}$,
$\mathrm{p} = m\mathrm{v}$, $\mathrm{J} = \Delta \mathrm{p}$, $\sum \mathrm{F} = m\mathrm{a}$, $\sum \mathrm{F} = \frac{d\mathrm{p}}{dt}$, $\mathrm{F}_{ab} = -\mathrm{F}_{ba}$, $K = \frac{1}{2} m v^2$, $W = \mathrm{F} \cdot \Delta \mathrm{s}$, $W = \int_1^2 \mathrm{F} \cdot d\mathrm{l} = -\Delta U$,
$W_{tot} = \Delta K$, $J = F_{ave} \Delta t$, $\mathrm{J} = \int_{t_1}^{t_2} \mathrm{F} dt$, $K = \frac{1}{2} I \omega^2$, $\mathrm{L} = \mathrm{r} \times \mathrm{p}$, $\bar{\tau} = \mathrm{r} \times \mathrm{F}$, $L = I\omega$, $\sum \bar{\tau} = \frac{d\mathrm{L}}{dt}$,

$$f = \frac{1}{2\pi}\sqrt{\frac{\kappa}{I}}, \quad f = \frac{1}{2\pi}\sqrt{\frac{k}{m}}, \quad f = \frac{1}{2\pi}\sqrt{\frac{g}{l}}, \quad f = \frac{1}{2\pi}\sqrt{\frac{mgd}{I}},$$

$$\frac{\partial^2 y}{\partial x^2} = \frac{1}{v^2}\frac{\partial^2 y}{\partial t^2}$$

$y = A\cos(kx - \omega t)$, $y = A\cos(kx + \omega t)$, $v = \sqrt{F/\mu}$, $y(x,t) = (A_{sw}\sin kx)\sin \omega t$.

$$f_L = \frac{v + v_L}{v + v_S} f_S.$$

$\vec{F} = \frac{1}{4\pi\epsilon_0}\frac{q_1 q_2}{r^2}\hat{r}$ $\quad \vec{E} = \frac{\vec{F_0}}{q_0}$ $\quad \vec{E} = \frac{1}{4\pi\epsilon_0}\frac{q}{r^2}\hat{r}$ $\quad \vec{E} = \frac{1}{4\pi\epsilon_0}\int \frac{dq}{r^2}\hat{r}$

$p = qd$ $\quad \vec{\tau} = \vec{p} \times \vec{E}$ $\quad U = -\vec{p} \cdot \vec{E}$

$$\Phi_E = \int \vec{\mathbf{E}} \cdot d\vec{\mathbf{A}} \qquad \oint \mathbf{E} \cdot d\mathbf{A} = \frac{Q_{enc}}{\epsilon_0}$$

$U = \frac{1}{4\pi\epsilon_0}\frac{qq_0}{r}$ $\quad V = \frac{U}{q_0}$ $\quad V = \frac{1}{4\pi\epsilon_0}\frac{q}{r}$ $\quad V = \frac{1}{4\pi\epsilon_0}\int \frac{dq}{r}$

$V_a - V_b = \int_a^b \vec{E} \cdot d\vec{l}$ $\quad E_x = -\frac{\partial V}{\partial x}$ $\quad E_y = -\frac{\partial V}{\partial y}$ $\quad E_z = -\frac{\partial V}{\partial z}$ $\quad E_r = -\frac{\partial V}{\partial r}$ $\quad C = \frac{Q}{V}$ $\quad C = \epsilon_0 \frac{A}{d}$

$U = \frac{Q^2}{2C}$ $\quad u = \frac{1}{2}\epsilon_0 E^2$ $\quad C = KC_0$ $\quad \epsilon = K\epsilon_0$